



# SEQUENCE LISTING

<110> MARKOWITZ, Sanford D.  
<120> METHODS FOR TREATING PATIENTS AND IDENTIFYING THERAPEUTICS  
<130> CWRU-P01-044  
<140> 10/650,112  
<141> 2003-08-26  
<150> 10/274,177  
<151> 2002-10-18  
<150> 10/229,245  
<151> 2002-08-26  
<150> 60/406,296  
<151> 2002-08-27  
<160> 27  
<170> PatentIn version 3.2  
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<213> Homo sapiens  
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Thr Val Ala Ala Gly Cys Pro Asp Gln Ser Pro Glu Leu Gln Pro Trp  
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Asn Pro Gly His Asp Gln Asp His His Val His Ile Gly Gln Gly Lys  
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Thr Leu Leu Leu Thr Ser Ser Ala Thr Val Tyr Ser Ile His Ile Ser  
35 40 45

Glu Gly Gly Lys Leu Val Ile Lys Asp His Asp Glu Pro Ile Val Leu  
50 55 60

Arg Thr Arg His Ile Leu Ile Asp Asn Gly Gly Glu Leu His Ala Gly  
65 70 75 80

Ser Ala Leu Cys Pro Phe Gln Gly Asn Phe Thr Ile Ile Leu Tyr Gly  
85 90 95

Arg Ala Asp Glu Gly Ile Gln Pro Asp Pro Tyr Tyr Gly Leu Lys Tyr  
100 105 110

Ile Gly Val Gly Lys Gly Gly Ala Leu Glu Leu His Gly Gln Lys Lys  
115 120 125

Leu Ser Trp Thr Phe Leu Asn Lys Thr Leu His Pro Gly Gly Met Ala  
130 135 140



Glu Gly Gly Tyr Phe Phe Glu Arg Ser Trp Gly His Arg Gly Val Ile  
 145 150 155 160  
 Val His Val Ile Asp Pro Lys Ser Gly Thr Val Ile His Ser Asp Arg  
 165 170 175  
 Phe Asp Thr Tyr Arg Ser Lys Lys Glu Ser Glu Arg Leu Val Gln Tyr  
 180 185 190  
 Leu Asn Ala Val Pro Asp Gly Arg Ile Leu Ser Val Ala Val Asn Asp  
 195 200 205  
 Glu Gly Ser Arg Asn Leu Asp Asp Met Ala Arg Lys Ala Met Thr Lys  
 210 215 220  
 Leu Gly Ser Lys His Phe Leu His Leu Gly Phe Arg His Pro Trp Ser  
 225 230 235 240  
 Phe Leu Thr Val Lys Gly Asn Pro Ser Ser Ser Val Glu Asp His Ile  
 245 250 255  
 Glu Tyr His Gly His Arg Gly Ser Ala Ala Ala Arg Val Phe Lys Leu  
 260 265 270  
 Phe Gln Thr Glu His Gly Glu Tyr Phe Asn Val Ser Leu Ser Ser Glu  
 275 280 285  
 Trp Val Gln Asp Val Glu Trp Thr Glu Trp Phe Asp His Asp Lys Val  
 290 295 300  
 Ser Gln Thr Lys Gly Gly Glu Lys Ile Ser Asp Leu Trp Lys Ala His  
 305 310 315 320  
 Pro Gly Lys Ile Cys Asn Arg Pro Ile Asp Ile Gln Ala Thr Thr Met  
 325 330 335  
 Asp Gly Val Asn Leu Ser Thr Glu Val Val Tyr Lys Lys Gly Gln Asp  
 340 345 350  
 Tyr Arg Phe Ala Cys Tyr Asp Arg Gly Arg Ala Cys Arg Ser Tyr Arg  
 355 360 365  
 Val Arg Phe Leu Cys Gly Lys Pro Val Arg Pro Lys Leu Thr Val Thr  
 370 375 380  
 Ile Asp Thr Asn Val Asn Ser Thr Ile Leu Asn Leu Glu Asp Asn Val  
 385 390 395 400  
 Gln Ser Trp Lys Pro Gly Asp Thr Leu Val Ile Ala Ser Thr Asp Tyr  
 405 410 415  
 Ser Met Tyr Gln Ala Glu Glu Phe Gln Val Leu Pro Cys Arg Ser Cys  
 420 425 430  
 Ala Pro Asn Gln Val Lys Val Ala Gly Lys Pro Met Tyr Leu His Ile



435					440					445					
Gly	Glu	Glu	Ile	Asp	Gly	Val	Asp	Met	Arg	Ala	Glu	Val	Gly	Leu	Leu
450					455					460					
Ser	Arg	Asn	Ile	Ile	Val	Met	Gly	Glu	Met	Glu	Asp	Lys	Cys	Tyr	Pro
465					470					475					480
Tyr	Arg	Asn	His	Ile	Cys	Asn	Phe	Phe	Asp	Phe	Asp	Thr	Phe	Gly	Gly
			485						490					495	
His	Ile	Lys	Phe	Ala	Leu	Gly	Phe	Lys	Ala	Ala	His	Leu	Glu	Gly	Thr
			500					505					510		
Glu	Leu	Lys	His	Met	Gly	Gln	Gln	Leu	Val	Gly	Gln	Tyr	Pro	Ile	His
		515					520					525			
Phe	His	Leu	Ala	Gly	Asp	Val	Asp	Glu	Arg	Gly	Gly	Tyr	Asp	Pro	Pro
	530					535					540				
Thr	Tyr	Ile	Arg	Asp	Leu	Ser	Ile	His	His	Thr	Phe	Ser	Arg	Cys	Val
545					550					555					560
Thr	Val	His	Gly	Ser	Asn	Gly	Leu	Leu	Ile	Lys	Asp	Val	Val	Gly	Tyr
			565						570					575	
Asn	Ser	Leu	Gly	His	Cys	Phe	Phe	Thr	Glu	Asp	Gly	Pro	Glu	Glu	Arg
			580					585					590		
Asn	Thr	Phe	Asp	His	Cys	Leu	Gly	Leu	Leu	Val	Lys	Ser	Gly	Thr	Leu
		595					600					605			
Leu	Pro	Ser	Asp	Arg	Asp	Ser	Lys	Met	Cys	Lys	Met	Ile	Thr	Glu	Asp
	610					615					620				
Ser	Tyr	Pro	Gly	Tyr	Ile	Pro	Lys	Pro	Arg	Gln	Asp	Cys	Asn	Ala	Val
625					630					635					640
Ser	Thr	Phe	Trp	Met	Ala	Asn	Pro	Asn	Asn	Asn	Leu	Ile	Asn	Cys	Ala
			645					650						655	
Ala	Ala	Gly	Ser	Glu	Glu	Thr	Gly	Phe	Trp	Phe	Ile	Phe	His	His	Val
			660					665					670		
Pro	Thr	Gly	Pro	Ser	Val	Gly	Met	Tyr	Ser	Pro	Gly	Tyr	Ser	Glu	His
		675					680					685			
Ile	Pro	Leu	Gly	Lys	Phe	Tyr	Asn	Asn	Arg	Ala	His	Ser	Asn	Tyr	Arg
	690					695					700				
Ala	Gly	Met	Ile	Ile	Asp	Asn	Gly	Val	Lys	Thr	Thr	Glu	Ala	Ser	Ala
705					710					715					720
Lys	Asp	Lys	Arg	Pro	Phe	Leu	Ser	Ile	Ile	Ser	Ala	Arg	Tyr	Ser	Pro
				725					730					735	



His Gln Asp Ala Asp Pro Leu Lys Pro Arg Glu Pro Ala Ile Ile Arg  
 740 745 750

His Phe Ile Ala Tyr Lys Asn Gln Asp His Gly Ala Trp Leu Arg Gly  
 755 760 765

Gly Asp Val Trp Leu Asp Ser Cys Arg Phe Ala Asp Asn Gly Ile Gly  
 770 775 780

Leu Thr Leu Ala Ser Gly Gly Thr Phe Pro Tyr Asp Asp Gly Ser Lys  
 785 790 795 800

Gln Glu Ile Lys Asn Ser Leu Phe Val Gly Glu Ser Gly Asn Val Gly  
 805 810 815

Thr Glu Met Met Asp Asn Arg Ile Trp Gly Pro Gly Gly Leu Asp His  
 820 825 830

Ser Gly Arg Thr Leu Pro Ile Gly Gln Asn Phe Pro Ile Arg Gly Ile  
 835 840 845

Gln Leu Tyr Asp Gly Pro Ile Asn Ile Gln Asn Cys Thr Phe Arg Lys  
 850 855 860

Phe Val Ala Leu Glu Gly Arg His Thr Ser Ala Leu Ala Phe Arg Leu  
 865 870 875 880

Asn Asn Ala Trp Gln Ser Cys Pro His Asn Asn Val Thr Gly Ile Ala  
 885 890 895

Phe Glu Asp Val Pro Ile Thr Ser Arg Val Phe Phe Gly Glu Pro Gly  
 900 905 910

Pro Trp Phe Asn Gln Leu Asp Met Asp Gly Asp Lys Thr Ser Val Phe  
 915 920 925

His Asp Val Asp Gly Ser Val Ser Glu Tyr Pro Gly Ser Tyr Leu Thr  
 930 935 940

Lys Asn Asp Asn Trp Leu Val Arg His Pro Asp Cys Ile Asn Val Pro  
 945 950 955 960

Asp Trp Arg Gly Ala Ile Cys Ser Gly Cys Tyr Ala Gln Met Tyr Ile  
 965 970 975

Gln Ala Tyr Lys Thr Ser Asn Leu Arg Met Lys Ile Ile Lys Asn Asp  
 980 985 990

Phe Pro Ser His Pro Leu Tyr Leu Glu Gly Ala Leu Thr Arg Ser Thr  
 995 1000 1005

His Tyr Gln Gln Tyr Gln Pro Val Val Thr Leu Gln Lys Gly Tyr  
 1010 1015 1020

Thr Ile His Trp Asp Gln Thr Ala Pro Ala Glu Leu Ala Ile Trp  
 1025 1030 1035



Leu	Ile	Asn	Phe	Asn	Lys	Gly	Asp	Trp	Ile	Arg	Val	Gly	Leu	Cys
1040						1045					1050			
Tyr	Pro	Arg	Gly	Thr	Thr	Phe	Ser	Ile	Leu	Ser	Asp	Val	His	Asn
1055						1060					1065			
Arg	Leu	Leu	Lys	Gln	Thr	Ser	Lys	Thr	Gly	Val	Phe	Val	Arg	Thr
1070						1075					1080			
Leu	Gln	Met	Asp	Lys	Val	Glu	Gln	Ser	Tyr	Pro	Gly	Arg	Ser	His
1085						1090					1095			
Tyr	Tyr	Trp	Asp	Glu	Asp	Ser	Gly	Leu	Leu	Phe	Leu	Lys	Leu	Lys
1100						1105					1110			
Ala	Gln	Asn	Glu	Arg	Glu	Lys	Phe	Ala	Phe	Cys	Ser	Met	Lys	Gly
1115						1120					1125			
Cys	Glu	Arg	Ile	Lys	Ile	Lys	Ala	Leu	Ile	Pro	Lys	Asn	Ala	Gly
1130						1135					1140			
Val	Ser	Asp	Cys	Thr	Ala	Thr	Ala	Tyr	Pro	Lys	Phe	Thr	Glu	Arg
1145						1150					1155			
Ala	Val	Val	Asp	Val	Pro	Met	Pro	Lys	Lys	Leu	Phe	Gly	Ser	Gln
1160						1165					1170			
Leu	Lys	Thr	Lys	Asp	His	Phe	Leu	Glu	Val	Lys	Met	Glu	Ser	Ser
1175						1180					1185			
Lys	Gln	His	Phe	Phe	His	Leu	Trp	Asn	Asp	Phe	Ala	Tyr	Ile	Glu
1190						1195					1200			
Val	Asp	Gly	Lys	Lys	Tyr	Pro	Ser	Ser	Glu	Asp	Gly	Ile	Gln	Val
1205						1210					1215			
Val	Val	Ile	Asp	Gly	Asn	Gln	Gly	Arg	Val	Val	Ser	His	Thr	Ser
1220						1225					1230			
Phe	Arg	Asn	Ser	Ile	Leu	Gln	Gly	Ile	Pro	Trp	Gln	Leu	Phe	Asn
1235						1240					1245			
Tyr	Val	Ala	Thr	Ile	Pro	Asp	Asn	Ser	Ile	Val	Leu	Met	Ala	Ser
1250						1255					1260			
Lys	Gly	Arg	Tyr	Val	Ser	Arg	Gly	Pro	Trp	Thr	Arg	Val	Leu	Glu
1265						1270					1275			
Lys	Leu	Gly	Ala	Asp	Arg	Gly	Leu	Lys	Leu	Lys	Glu	Gln	Met	Ala
1280						1285					1290			
Phe	Val	Gly	Phe	Lys	Gly	Ser	Phe	Arg	Pro	Ile	Trp	Val	Thr	Leu
1295						1300					1305			
Asp	Thr	Glu	Asp	His	Lys	Ala	Lys	Ile	Phe	Gln	Val	Val	Pro	Ile
1310						1315					1320			



Pro Val Val Lys Lys Lys Lys Leu  
1325 1330

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<213> Homo sapiens

<400> 2

Ala Gly Cys Pro Asp Gln Ser Pro Glu Leu Gln Pro Trp Asn Pro Gly  
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His Asp Gln Asp His His Val His Ile Gly Gln Gly Lys Thr Leu Leu  
20 25 30

Leu Thr Ser Ser Ala Thr Val Tyr Ser Ile His Ile Ser Glu Gly Gly  
35 40 45

Lys Leu Val Ile Lys Asp His Asp Glu Pro Ile Val Leu Arg Thr Arg  
50 55 60

His Ile Leu Ile Asp Asn Gly Gly Glu Leu His Ala Gly Ser Ala Leu  
65 70 75 80

Cys Pro Phe Gln Gly Asn Phe Thr Ile Ile Leu Tyr Gly Arg Ala Asp  
85 90 95

Glu Gly Ile Gln Pro Asp Pro Tyr Tyr Gly Leu Lys Tyr Ile Gly Val  
100 105 110

Gly Lys Gly Gly Ala Leu Glu Leu His Gly Gln Lys Lys Leu Ser Trp  
115 120 125

Thr Phe Leu Asn Lys Thr Leu His Pro Gly Gly Met Ala Glu Gly Gly  
130 135 140

Tyr Phe Phe Glu Arg Ser Trp Gly His Arg Gly Val Ile Val His Val  
145 150 155 160

Ile Asp Pro Lys Ser Gly Thr Val Ile His Ser Asp Arg Phe Asp Thr  
165 170 175

Tyr Arg Ser Lys Lys Glu Ser Glu Arg Leu Val Gln Tyr Leu Asn Ala  
180 185 190

Val Pro Asp Gly Arg Ile Leu Ser Val Ala Val Asn Asp Glu Gly Ser  
195 200 205

Arg Asn Leu Asp Asp Met Ala Arg Lys Ala Met Thr Lys Leu Gly Ser  
210 215 220

Lys His Phe Leu His Leu Gly Phe Arg His Pro Trp Ser Phe Leu Thr  
225 230 235 240

Val Lys Gly Asn Pro Ser Ser Ser Val Glu Asp His Ile Glu Tyr His



				245						250					255				
Gly	His	Arg	Gly	Ser	Ala	Ala	Ala	Arg	Val	Phe	Lys	Leu	Phe	Gln	Thr				
			260					265					270						
Glu	His	Gly	Glu	Tyr	Phe	Asn	Val	Ser	Leu	Ser	Ser	Glu	Trp	Val	Gln				
		275					280					285							
Asp	Val	Glu	Trp	Thr	Glu	Trp	Phe	Asp	His	Asp	Lys	Val	Ser	Gln	Thr				
	290					295					300								
Lys	Gly	Gly	Glu	Lys	Ile	Ser	Asp	Leu	Trp	Lys	Ala	His	Pro	Gly	Lys				
305					310					315				320					
Ile	Cys	Asn	Arg	Pro	Ile	Asp	Ile	Gln	Ala	Thr	Thr	Met	Asp	Gly	Val				
				325				330						335					
Asn	Leu	Ser	Thr	Glu	Val	Val	Tyr	Lys	Lys	Gly	Gln	Asp	Tyr	Arg	Phe				
			340					345					350						
Ala	Cys	Tyr	Asp	Arg	Gly	Arg	Ala	Cys	Arg	Ser	Tyr	Arg	Val	Arg	Phe				
		355					360					365							
Leu	Cys	Gly	Lys	Pro	Val	Arg	Pro	Lys	Leu	Thr	Val	Thr	Ile	Asp	Thr				
	370					375					380								
Asn	Val	Asn	Ser	Thr	Ile	Leu	Asn	Leu	Glu	Asp	Asn	Val	Gln	Ser	Trp				
385					390					395					400				
Lys	Pro	Gly	Asp	Thr	Leu	Val	Ile	Ala	Ser	Thr	Asp	Tyr	Ser	Met	Tyr				
				405				410						415					
Gln	Ala	Glu	Glu	Phe	Gln	Val	Leu	Pro	Cys	Arg	Ser	Cys	Ala	Pro	Asn				
		420						425					430						
Gln	Val	Lys	Val	Ala	Gly	Lys	Pro	Met	Tyr	Leu	His	Ile	Gly	Glu	Glu				
		435					440					445							
Ile	Asp	Gly	Val	Asp	Met	Arg	Ala	Glu	Val	Gly	Leu	Leu	Ser	Arg	Asn				
	450					455					460								
Ile	Ile	Val	Met	Gly	Glu	Met	Glu	Asp	Lys	Cys	Tyr	Pro	Tyr	Arg	Asn				
465					470				475						480				
His	Ile	Cys	Asn	Phe	Phe	Asp	Phe	Asp	Thr	Phe	Gly	Gly	His	Ile	Lys				
			485					490						495					
Phe	Ala	Leu	Gly	Phe	Lys	Ala	Ala	His	Leu	Glu	Gly	Thr	Glu	Leu	Lys				
		500						505					510						
His	Met	Gly	Gln	Gln	Leu	Val	Gly	Gln	Tyr	Pro	Ile	His	Phe	His	Leu				
		515					520					525							
Ala	Gly	Asp	Val	Asp	Glu	Arg	Gly	Gly	Tyr	Asp	Pro	Pro	Thr	Tyr	Ile				
	530					535					540								
Arg	Asp	Leu	Ser	Ile	His	His	Thr	Phe	Ser	Arg	Cys	Val	Thr	Val	His				



545		550		555		560
Gly Ser Asn Gly Leu Leu Ile Lys Asp Val Val Gly Tyr Asn Ser Leu						
	565			570		575
Gly His Cys Phe Phe Thr Glu Asp Gly Pro Glu Glu Arg Asn Thr Phe						
	580			585		590
Asp His Cys Leu Gly Leu Leu Val Lys Ser Gly Thr Leu Leu Pro Ser						
	595			600		605
Asp Arg Asp Ser Lys Met Cys Lys Met Ile Thr Glu Asp Ser Tyr Pro						
	610			615		620
Gly Tyr Ile Pro Lys Pro Arg Gln Asp Cys Asn Ala Val Ser Thr Phe						
	625			630		635
Trp Met Ala Asn Pro Asn Asn Asn Leu Ile Asn Cys Ala Ala Ala Gly						
		645			650	655
Ser Glu Glu Thr Gly Phe Trp Phe Ile Phe His His Val Pro Thr Gly						
		660			665	670
Pro Ser Val Gly Met Tyr Ser Pro Gly Tyr Ser Glu His Ile Pro Leu						
		675			680	685
Gly Lys Phe Tyr Asn Asn Arg Ala His Ser Asn Tyr Arg Ala Gly Met						
		690			695	700
Ile Ile Asp Asn Gly Val Lys Thr Thr Glu Ala Ser Ala Lys Asp Lys						
		705			710	715
Arg Pro Phe Leu Ser Ile Ile Ser Ala Arg Tyr Ser Pro His Gln Asp						
		725			730	735
Ala Asp Pro Leu Lys Pro Arg Glu Pro Ala Ile Ile Arg His Phe Ile						
		740			745	750
Ala Tyr Lys Asn Gln Asp His Gly Ala Trp Leu Arg Gly Gly Asp Val						
		755			760	765
Trp Leu Asp Ser Cys Arg Phe Ala Asp Asn Gly Ile Gly Leu Thr Leu						
		770			775	780
Ala Ser Gly Gly Thr Phe Pro Tyr Asp Asp Gly Ser Lys Gln Glu Ile						
		785			790	795
Lys Asn Ser Leu Phe Val Gly Glu Ser Gly Asn Val Gly Thr Glu Met						
		805			810	815
Met Asp Asn Arg Ile Trp Gly Pro Gly Gly Leu Asp His Ser Gly Arg						
		820			825	830
Thr Leu Pro Ile Gly Gln Asn Phe Pro Ile Arg Gly Ile Gln Leu Tyr						
		835			840	845
Asp Gly Pro Ile Asn Ile Gln Asn Cys Thr Phe Arg Lys Phe Val Ala						



850	855	860
Leu Glu Gly Arg His Thr Ser Ala Leu Ala Phe Arg Leu Asn Asn Ala		
865	870	875 880
Trp Gln Ser Cys Pro His Asn Asn Val Thr Gly Ile Ala Phe Glu Asp		
	885	890 895
Val Pro Ile Thr Ser Arg Val Phe Phe Gly Glu Pro Gly Pro Trp Phe		
	900	905 910
Asn Gln Leu Asp Met Asp Gly Asp Lys Thr Ser Val Phe His Asp Val		
	915	920 925
Asp Gly Ser Val Ser Glu Tyr Pro Gly Ser Tyr Leu Thr Lys Asn Asp		
	930	935 940
Asn Trp Leu Val Arg His Pro Asp Cys Ile Asn Val Pro Asp Trp Arg		
	945	950 955 960
Gly Ala Ile Cys Ser Gly Cys Tyr Ala Gln Met Tyr Ile Gln Ala Tyr		
	965	970 975
Lys Thr Ser Asn Leu Arg Met Lys Ile Ile Lys Asn Asp Phe Pro Ser		
	980	985 990
His Pro Leu Tyr Leu Glu Gly Ala Leu Thr Arg Ser Thr His Tyr Gln		
	995	1000 1005
Gln Tyr Gln Pro Val Val Thr Leu Gln Lys Gly Tyr Thr Ile His		
	1010	1015 1020
Trp Asp Gln Thr Ala Pro Ala Glu Leu Ala Ile Trp Leu Ile Asn		
	1025	1030 1035
Phe Asn Lys Gly Asp Trp Ile Arg Val Gly Leu Cys Tyr Pro Arg		
	1040	1045 1050
Gly Thr Thr Phe Ser Ile Leu Ser Asp Val His Asn Arg Leu Leu		
	1055	1060 1065
Lys Gln Thr Ser Lys Thr Gly Val Phe Val Arg Thr Leu Gln Met		
	1070	1075 1080
Asp Lys Val Glu Gln Ser Tyr Pro Gly Arg Ser His Tyr Tyr Trp		
	1085	1090 1095
Asp Glu Asp Ser Gly Leu Leu Phe Leu Lys Leu Lys Ala Gln Asn		
	1100	1105 1110
Glu Arg Glu Lys Phe Ala Phe Cys Ser Met Lys Gly Cys Glu Arg		
	1115	1120 1125
Ile Lys Ile Lys Ala Leu Ile Pro Lys Asn Ala Gly Val Ser Asp		
	1130	1135 1140
Cys Thr Ala Thr Ala Tyr Pro Lys Phe Thr Glu Arg Ala Val Val		



1145	1150	1155
Asp Val Pro Met Pro Lys	Lys Leu Phe Gly Ser	Gln Leu Lys Thr
1160	1165	1170
Lys Asp His Phe Leu Glu	Val Lys Met Glu Ser	Ser Lys Gln His
1175	1180	1185
Phe Phe His Leu Trp Asn	Asp Phe Ala Tyr Ile	Glu Val Asp Gly
1190	1195	1200
Lys Lys Tyr Pro Ser Ser	Glu Asp Gly Ile Gln	Val Val Val Ile
1205	1210	1215
Asp Gly Asn Gln Gly Arg	Val Val Ser His Thr	Ser Phe Arg Asn
1220	1225	1230
Ser Ile Leu Gln Gly Ile	Pro Trp Gln Leu Phe	Asn Tyr Val Ala
1235	1240	1245
Thr Ile Pro Asp Asn Ser	Ile Val Leu Met Ala	Ser Lys Gly Arg
1250	1255	1260
Tyr Val Ser Arg Gly Pro	Trp Thr Arg Val Leu	Glu Lys Leu Gly
1265	1270	1275
Ala Asp Arg Gly Leu Lys	Leu Lys Glu Gln Met	Ala Phe Val Gly
1280	1285	1290
Phe Lys Gly Ser Phe Arg	Pro Ile Trp Val Thr	Leu Asp Thr Glu
1295	1300	1305
Asp His Lys Ala Lys Ile	Phe Gln Val Val Pro	Ile Pro Val Val
1310	1315	1320
Lys Lys Lys Lys Leu		
1325		
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Leu Gln Glu Val His Val	Ser Lys Glu Thr Ile Gly	Lys Ile Ser Ala
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Ala Ser Lys Met Met Trp	Cys Ser Ala Ala Val Asp	Ile Met Phe Leu
20	25	30
Leu Asp Gly Ser Asn Ser	Val Gly Lys Gly Ser Phe	Glu Arg Ser Lys
35	40	45
His Phe Ala Ile Thr Val	Cys Asp Gly Leu Asp Ile	Ser Pro Glu Arg
50	55	60



Val	Arg	Val	Gly	Ala	Phe	Gln	Phe	Ser	Ser	Thr	Pro	His	Leu	Glu	Phe	65	70	75	80
Pro	Leu	Asp	Ser	Phe	Ser	Thr	Gln	Gln	Glu	Val	Lys	Ala	Arg	Ile	Lys	85	90	95	
Arg	Met	Val	Phe	Lys	Gly	Gly	Arg	Thr	Glu	Thr	Glu	Leu	Ala	Leu	Lys	100	105	110	
Tyr	Leu	Leu	His	Arg	Gly	Leu	Pro	Gly	Gly	Arg	Asn	Ala	Ser	Val	Pro	115	120	125	
Gln	Ile	Leu	Ile	Ile	Val	Thr	Asp	Gly	Lys	Ser	Gln	Gly	Asp	Val	Ala	130	135	140	
Leu	Pro	Ser	Lys	Gln	Leu	Lys	Glu	Arg	Gly	Val	Thr	Val	Phe	Ala	Val	145	150	155	160
Gly	Val	Arg	Phe	Pro	Arg	Trp	Glu	Glu	Leu	His	Ala	Leu	Ala	Ser	Glu	165	170	175	
Pro	Arg	Gly	Gln	His	Val	Leu	Leu	Ala	Glu	Gln	Val	Glu	Asp	Ala	Thr	180	185	190	
Asn	Gly	Leu	Phe	Ser	Thr	Leu	Ser	Ser	Ser	Ala	Ile	Cys	Ser	Ser	Ala	195	200	205	
Thr	Pro	Asp	Cys	Arg	Val	Glu	Ala	His	Pro	Cys	Glu	His	Arg	Thr	Leu	210	215	220	
Glu	Met	Val	Arg	Glu	Phe	Ala	Gly	Asn	Ala	Pro	Cys	Trp	Arg	Gly	Ser	225	230	235	240
Arg	Arg	Thr	Leu	Ala	Val	Leu	Ala	Ala	His	Cys	Pro	Phe	Tyr	Ser	Trp	245	250	255	
Lys	Arg	Val	Phe	Leu	Thr	His	Pro	Ala	Thr	Cys	Tyr	Arg	Thr	Thr	Cys	260	265	270	
Pro	Gly	Pro	Cys	Asp	Ser	Gln	Pro	Cys	Gln	Asn	Gly	Gly	Thr	Cys	Val	275	280	285	
Pro	Glu	Gly	Leu	Asp	Gly	Tyr	Gln	Cys	Leu	Cys	Pro	Leu	Ala	Phe	Gly	290	295	300	
Gly	Glu	Ala	Asn	Cys	Ala	Leu	Lys	Leu	Ser	Leu	Glu	Cys	Arg	Val	Asp	305	310	315	320
Leu	Leu	Phe	Leu	Leu	Asp	Ser	Ser	Ala	Gly	Thr	Thr	Leu	Asp	Gly	Phe	325	330	335	
Leu	Arg	Ala	Lys	Val	Phe	Val	Lys	Arg	Phe	Val	Arg	Ala	Val	Leu	Ser	340	345	350	
Glu	Asp	Ser	Arg	Ala	Arg	Val	Gly	Val	Ala	Thr	Tyr	Ser	Arg	Glu	Leu	355	360	365	



Leu Val Ala Val Pro Val Gly Glu Tyr Gln Asp Val Pro Asp Leu Val  
 370 375 380

Trp Ser Leu Asp Gly Ile Pro Phe Arg Gly Gly Pro Thr Leu Thr Gly  
 385 390 395 400

Ser Ala Leu Arg Gln Ala Ala Glu Arg Gly Phe Gly Ser Ala Thr Arg  
 405 410 415

Thr Gly Gln Asp Arg Pro Arg Arg Val Val Val Leu Leu Thr Glu Ser  
 420 425 430

His Ser Glu Asp Glu Val Ala Gly Pro Ala Arg His Ala Arg Ala Arg  
 435 440 445

Glu Leu Leu Leu Leu Gly Val Gly Ser Glu Ala Val Arg Ala Glu Leu  
 450 455 460

Glu Glu Ile Thr Gly Ser Pro Lys His Val Met Val Tyr Ser Asp Pro  
 465 470 475 480

Gln Asp Leu Phe Asn Gln Ile Pro Glu Leu Gln Gly Lys Leu Cys Ser  
 485 490 495

Arg Gln Arg Pro Gly Cys Arg Thr Gln Ala Leu Asp Leu Val Phe Met  
 500 505 510

Leu Asp Thr Ser Ala Ser Val Gly Pro Glu Asn Phe Ala Gln Met Gln  
 515 520 525

Ser Phe Val Arg Ser Cys Ala Leu Gln Phe Glu Val Asn Pro Asp Val  
 530 535 540

Thr Gln Val Gly Leu Val Val Tyr Gly Ser Gln Val Gln Thr Ala Phe  
 545 550 555 560

Gly Leu Asp Thr Lys Pro Thr Arg Ala Ala Met Leu Arg Ala Ile Ser  
 565 570 575

Gln Ala Pro Tyr Leu Gly Gly Val Gly Ser Ala Gly Thr Ala Leu Leu  
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Gly Pro Arg Asp Ser Leu Ile His Val Ala Ala Tyr Ala Asp Leu Arg



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Gly	Lys	Leu	Val	Ile	Lys	Asp	His	Asp	Glu	Pro	Ile	Val	Leu	Arg	Thr	85	90	95	
Arg	His	Ile	Leu	Ile	Asp	Asn	Gly	Gly	Glu	Leu	His	Ala	Gly	Ser	Ala	100	105	110	
Leu	Cys	Pro	Phe	Gln	Gly	Asn	Phe	Thr	Ile	Ile	Leu	Tyr	Gly	Arg	Ala	115	120	125	
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Thr	Tyr	Arg	Ser	Lys	Lys	Glu	Ser	Glu	Arg	Leu	Val	Gln	Tyr	Leu	Asn	210	215	220	



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Ser Arg Asn Leu Asp Asp Met Ala Arg Lys Ala Met Thr Lys Leu Gly	
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Ser Lys His Phe Leu His Leu Gly Phe Arg His Pro Trp Ser Phe Leu	
	260 265 270
Thr Val Lys Gly Asn Pro Ser Ser Ser Val Glu Asp His Ile Glu Tyr	
	275 280 285
His Gly His Arg Gly Ser Ala Ala Ala Arg Val Phe Lys Leu Phe Gln	
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Thr Glu His Gly Glu Tyr Phe Asn Val Ser Leu Ser Ser Glu Trp Val	
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Gln Asp Val Glu Trp Thr Glu Trp Phe Asp His Asp Lys Val Ser Gln	
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Thr Lys Gly Gly Glu Lys Ile Ser Asp Leu Trp Lys Ala His Pro Gly	
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Tyr Gln Ala Glu Glu Phe Gln Val Leu Pro Cys Arg Ser Cys Ala Pro	
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Glu Ile Asp Gly Val Asp Met Arg Ala Glu Val Gly Leu Leu Ser Arg	
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Asn His Ile Cys Asn Phe Phe Asp Phe Asp Thr Phe Gly Gly His Ile	
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Phe	Asp	His	Cys	Leu	Gly	Leu	Leu	Val	Lys	Ser	Gly	Thr	Leu	Leu	Pro	625	630	635
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Tyr	Asp	Gly	Pro	Ile	Asn	Ile	Gln	Asn	Cys	Thr	Phe	Arg	Lys	Phe	Val	885	890	895	
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Leu	Ile	Asn	Phe	Asn	Lys	Gly	Asp	Trp	Ile	Arg	Val	Gly	Leu	Cys		1070	1075	1080	
Tyr	Pro	Arg	Gly	Thr	Thr	Phe	Ser	Ile	Leu	Ser	Asp	Val	His	Asn		1085	1090	1095	
Arg	Leu	Leu	Lys	Gln	Thr	Ser	Lys	Thr	Gly	Val	Phe	Val	Arg	Thr		1100	1105	1110	
Leu	Gln	Met	Asp	Lys	Val	Glu	Gln	Ser	Tyr	Pro	Gly	Arg	Ser	His		1115	1120	1125	



Tyr Tyr Trp Asp Glu Asp Ser Gly Leu Leu Phe Leu Lys Leu Lys  
 1130 1135 1140

Ala Gln Asn Glu Arg Glu Lys Phe Ala Phe Cys Ser Met Lys Gly  
 1145 1150 1155

Cys Glu Arg Ile Lys Ile Lys Ala Leu Ile Pro Lys Asn Ala Gly  
 1160 1165 1170

Val Ser Asp Cys Thr Ala Thr Ala Tyr Pro Lys Phe Thr Glu Arg  
 1175 1180 1185

Ala Val Val Asp Val Pro Met Pro Lys Lys Leu Phe Gly Ser Gln  
 1190 1195 1200

Leu Lys Thr Lys Asp His Phe Leu Glu Val Lys Met Glu Ser Ser  
 1205 1210 1215

Lys Gln His Phe Phe His Leu Trp Asn Asp Phe Ala Tyr Ile Glu  
 1220 1225 1230

Val Asp Gly Lys Lys Tyr Pro Ser Ser Glu Asp Gly Ile Gln Val  
 1235 1240 1245

Val Val Ile Asp Gly Asn Gln Gly Arg Val Val Ser His Thr Ser  
 1250 1255 1260

Phe Arg Asn Ser Ile Leu Gln Gly Ile Pro Trp Gln Leu Phe Asn  
 1265 1270 1275

Tyr Val Ala Thr Ile Pro Asp Asn Ser Ile Val Leu Met Ala Ser  
 1280 1285 1290

Lys Gly Arg Tyr Val Ser Arg Gly Pro Trp Thr Arg Val Leu Glu  
 1295 1300 1305

Lys Leu Gly Ala Asp Arg Gly Leu Lys Leu Lys Glu Gln Met Ala  
 1310 1315 1320

Phe Val Gly Phe Lys Gly Ser Phe Arg Pro Ile Trp Val Thr Leu  
 1325 1330 1335

Asp Thr Glu Asp His Lys Ala Lys Ile Phe Gln Val Val Pro Ile  
 1340 1345 1350

Pro Val Val Lys Lys Lys Lys Leu  
 1355 1360

<210> 14  
 <211> 755  
 <212> PRT  
 <213> Homo sapiens

<400> 14

Met Pro Pro Phe Leu Leu Leu Glu Ala Val Cys Val Phe Leu Phe Ser



1	5	10	15
Arg Val Pro Pro Ser Leu Pro Leu Gln Glu Val His Val Ser Lys Glu	20	25	30
Thr Ile Gly Lys Ile Ser Ala Ala Ser Lys Met Met Trp Cys Ser Ala	35	40	45
Ala Val Asp Ile Met Phe Leu Leu Asp Gly Ser Asn Ser Val Gly Lys	50	55	60
Gly Ser Phe Glu Arg Ser Lys His Phe Ala Ile Thr Val Cys Asp Gly	65	70	75
Leu Asp Ile Ser Pro Glu Arg Val Arg Val Gly Ala Phe Gln Phe Ser	85	90	95
Ser Thr Pro His Leu Glu Phe Pro Leu Asp Ser Phe Ser Thr Gln Gln	100	105	110
Glu Val Lys Ala Arg Ile Lys Arg Met Val Phe Lys Gly Gly Arg Thr	115	120	125
Glu Thr Glu Leu Ala Leu Lys Tyr Leu Leu His Arg Gly Leu Pro Gly	130	135	140
Gly Arg Asn Ala Ser Val Pro Gln Ile Leu Ile Ile Val Thr Asp Gly	145	150	155
Lys Ser Gln Gly Asp Val Ala Leu Pro Ser Lys Gln Leu Lys Glu Arg	165	170	175
Gly Val Thr Val Phe Ala Val Gly Val Arg Phe Pro Arg Trp Glu Glu	180	185	190
Leu His Ala Leu Ala Ser Glu Pro Arg Gly Gln His Val Leu Leu Ala	195	200	205
Glu Gln Val Glu Asp Ala Thr Asn Gly Leu Phe Ser Thr Leu Ser Ser	210	215	220
Ser Ala Ile Cys Ser Ser Ala Thr Pro Asp Cys Arg Val Glu Ala His	225	230	235
Pro Cys Glu His Arg Thr Leu Glu Met Val Arg Glu Phe Ala Gly Asn	245	250	255
Ala Pro Cys Trp Arg Gly Ser Arg Arg Thr Leu Ala Val Leu Ala Ala	260	265	270
His Cys Pro Phe Tyr Ser Trp Lys Arg Val Phe Leu Thr His Pro Ala	275	280	285
Thr Cys Tyr Arg Thr Thr Cys Pro Gly Pro Cys Asp Ser Gln Pro Cys	290	295	300
Gln Asn Gly Gly Thr Cys Val Pro Glu Gly Leu Asp Gly Tyr Gln Cys			



305		310		315		320
Leu Cys Pro Leu	Ala Phe Gly Gly Glu	Ala Asn Cys Ala Leu	Lys Leu			
	325	330	335			
Ser Leu Glu Cys Arg Val Asp	Leu Leu Phe Leu Leu Asp	Ser Ser Ala				
	340	345	350			
Gly Thr Thr Leu Asp Gly Phe	Leu Arg Ala Lys Val Phe	Val Lys Arg				
	355	360	365			
Phe Val Arg Ala Val Leu Ser	Glu Asp Ser Arg Ala Arg	Val Gly Val				
	370	375	380			
Ala Thr Tyr Ser Arg Glu Leu	Leu Val Ala Val Pro	Val Gly Glu Tyr				
385	390	395	400			
Gln Asp Val Pro Asp Leu Val	Trp Ser Leu Asp Gly Ile	Pro Phe Arg				
	405	410	415			
Gly Gly Pro Thr Leu Thr Gly	Ser Ala Leu Arg Gln Ala	Ala Glu Arg				
	420	425	430			
Gly Phe Gly Ser Ala Thr Arg	Thr Gly Gln Asp Arg Pro	Arg Arg Val				
	435	440	445			
Val Val Leu Leu Thr Glu Ser	His Ser Glu Asp Glu Val	Ala Gly Pro				
	450	455	460			
Ala Arg His Ala Arg Ala Arg	Glu Leu Leu Leu Gly Val	Gly Ser				
465	470	475	480			
Glu Ala Val Arg Ala Glu Leu	Glu Glu Ile Thr Gly Ser	Pro Lys His				
	485	490	495			
Val Met Val Tyr Ser Asp Pro	Gln Asp Leu Phe Asn Gln	Ile Pro Glu				
	500	505	510			
Leu Gln Gly Lys Leu Cys Ser	Arg Gln Arg Pro Gly Cys	Arg Thr Gln				
	515	520	525			
Ala Leu Asp Leu Val Phe Met	Leu Asp Thr Ser Ala Ser	Val Gly Pro				
	530	535	540			
Glu Asn Phe Ala Gln Met Gln	Ser Phe Val Arg Ser Cys	Ala Leu Gln				
545	550	555	560			
Phe Glu Val Asn Pro Asp Val	Thr Gln Val Gly Leu Val	Val Tyr Gly				
	565	570	575			
Ser Gln Val Gln Thr Ala Phe	Gly Leu Asp Thr Lys Pro	Thr Arg Ala				
	580	585	590			
Ala Met Leu Arg Ala Ile Ser	Gln Ala Pro Tyr Leu Gly	Gly Val Gly				
	595	600	605			
Ser Ala Gly Thr Ala Leu Leu	His Ile Tyr Asp Lys Val	Met Thr Val				



610	615	620
Gln Arg Gly Ala Arg Pro Gly Val Pro Lys Ala Val Val Val Leu Thr		
625	630	635 640
Gly Gly Arg Gly Ala Glu Asp Ala Ala Val Pro Ala Gln Lys Leu Arg		
	645	650 655
Asn Asn Gly Ile Ser Val Leu Val Val Gly Val Gly Pro Val Leu Ser		
	660	665 670
Glu Gly Leu Arg Arg Leu Ala Gly Pro Arg Asp Ser Leu Ile His Val		
	675	680 685
Ala Ala Tyr Ala Asp Leu Arg Tyr His Gln Asp Val Leu Ile Glu Trp		
	690	695 700
Leu Cys Gly Glu Ala Lys Gln Pro Val Asn Leu Cys Lys Pro Ser Pro		
705	710	715 720
Cys Met Asn Glu Gly Ser Cys Val Leu Gln Asn Gly Ser Tyr Arg Cys		
	725	730 735
Lys Cys Arg Asp Gly Trp Glu Gly Pro His Cys Glu Asn Arg Phe Leu		
	740	745 750
Arg Arg Pro		
	755	

<210> 15  
 <211> 300  
 <212> PRT  
 <213> Homo sapiens

<400> 15

Met Arg Ile Ala Val Ile Cys Phe Cys Leu Leu Gly Ile Thr Cys Ala	
1	5 10 15
Ile Pro Val Lys Gln Ala Asp Ser Gly Ser Ser Glu Glu Lys Gln Leu	
	20 25 30
Tyr Asn Lys Tyr Pro Asp Ala Val Ala Thr Trp Leu Asn Pro Asp Pro	
	35 40 45
Ser Gln Lys Gln Asn Leu Leu Ala Pro Gln Thr Leu Pro Ser Lys Ser	
	50 55 60
Asn Glu Ser His Asp His Met Asp Asp Met Asp Asp Glu Asp Asp Asp	
65	70 75 80
Asp His Val Asp Ser Gln Asp Ser Ile Asp Ser Asn Asp Ser Asp Asp	
	85 90 95
Val Asp Asp Thr Asp Asp Ser His Gln Ser Asp Glu Ser His His Ser	
	100 105 110



Asp	Glu	Ser	Asp	Glu	Leu	Val	Thr	Asp	Phe	Pro	Thr	Asp	Leu	Pro	Ala	
		115					120					125				
Thr	Glu	Val	Phe	Thr	Pro	Val	Val	Pro	Thr	Val	Asp	Thr	Tyr	Asp	Gly	
	130					135					140					
Arg	Gly	Asp	Ser	Val	Val	Tyr	Gly	Leu	Arg	Ser	Lys	Ser	Lys	Lys	Phe	
145					150					155					160	
Arg	Arg	Pro	Asp	Ile	Gln	Tyr	Pro	Asp	Ala	Thr	Asp	Glu	Asp	Ile	Thr	
				165					170					175		
Ser	His	Met	Glu	Ser	Glu	Glu	Leu	Asn	Gly	Ala	Tyr	Lys	Ala	Ile	Pro	
		180						185					190			
Val	Ala	Gln	Asp	Leu	Asn	Ala	Pro	Ser	Asp	Trp	Asp	Ser	Arg	Gly	Lys	
	195						200					205				
Asp	Ser	Tyr	Glu	Thr	Ser	Gln	Leu	Asp	Asp	Gln	Ser	Ala	Glu	Thr	His	
	210					215					220					
Ser	His	Lys	Gln	Ser	Arg	Leu	Tyr	Lys	Arg	Lys	Ala	Asn	Asp	Glu	Ser	
225					230					235					240	
Asn	Glu	His	Ser	Asp	Val	Ile	Asp	Ser	Gln	Glu	Leu	Ser	Lys	Val	Ser	
			245						250					255		
Arg	Glu	Phe	His	Ser	His	Glu	Phe	His	Ser	His	Glu	Asp	Met	Leu	Val	
		260						265					270			
Val	Asp	Pro	Lys	Ser	Lys	Glu	Glu	Asp	Lys	His	Leu	Lys	Phe	Arg	Ile	
	275						280					285				
Ser	His	Glu	Leu	Asp	Ser	Ala	Ser	Ser	Glu	Val	Asn					
	290					295					300					

<210> 16  
 <211> 829  
 <212> PRT  
 <213> Homo sapiens

<400> 16

Met	Gly	Leu	Pro	Arg	Gly	Pro	Leu	Ala	Ser	Leu	Leu	Leu	Leu	Gln	Val	
1				5					10					15		
Cys	Trp	Leu	Gln	Cys	Ala	Ala	Ser	Glu	Pro	Cys	Arg	Ala	Val	Phe	Arg	
		20						25					30			
Glu	Ala	Glu	Val	Thr	Leu	Glu	Ala	Gly	Gly	Ala	Glu	Gln	Glu	Pro	Gly	
	35						40					45				
Gln	Ala	Leu	Gly	Lys	Val	Phe	Met	Gly	Cys	Pro	Gly	Gln	Glu	Pro	Ala	
	50					55					60					
Leu	Phe	Ser	Thr	Asp	Asn	Asp	Asp	Phe	Thr	Val	Arg	Asn	Gly	Glu	Thr	
65					70					75					80	



Val	Gln	Glu	Arg	Arg	Ser	Leu	Lys	Glu	Arg	Asn	Pro	Leu	Lys	Ile	Phe		
				85					90					95			
Pro	Ser	Lys	Arg	Ile	Leu	Arg	Arg	His	Lys	Arg	Asp	Trp	Val	Val	Ala		
			100					105					110				
Pro	Ile	Ser	Val	Pro	Glu	Asn	Gly	Lys	Gly	Pro	Phe	Pro	Gln	Arg	Leu		
			115				120					125					
Asn	Gln	Leu	Lys	Ser	Asn	Lys	Asp	Arg	Asp	Thr	Lys	Ile	Phe	Tyr	Ser		
			130			135					140						
Ile	Thr	Gly	Pro	Gly	Ala	Asp	Ser	Pro	Pro	Glu	Gly	Val	Phe	Ala	Val		
145					150					155					160		
Glu	Lys	Glu	Thr	Gly	Trp	Leu	Leu	Leu	Asn	Lys	Pro	Leu	Asp	Arg	Glu		
				165					170					175			
Glu	Ile	Ala	Lys	Tyr	Glu	Leu	Phe	Gly	His	Ala	Val	Ser	Glu	Asn	Gly		
			180					185					190				
Ala	Ser	Val	Glu	Asp	Pro	Met	Asn	Ile	Ser	Ile	Ile	Val	Thr	Asp	Gln		
			195				200					205					
Asn	Asp	His	Lys	Pro	Lys	Phe	Thr	Gln	Asp	Thr	Phe	Arg	Gly	Ser	Val		
			210			215					220						
Leu	Glu	Gly	Val	Leu	Pro	Gly	Thr	Ser	Val	Met	Gln	Val	Thr	Ala	Thr		
225					230					235					240		
Asp	Glu	Asp	Asp	Ala	Ile	Tyr	Thr	Tyr	Asn	Gly	Val	Val	Ala	Tyr	Ser		
				245					250					255			
Ile	His	Ser	Gln	Glu	Pro	Lys	Asp	Pro	His	Asp	Leu	Met	Phe	Thr	Ile		
			260					265					270				
His	Arg	Ser	Thr	Gly	Thr	Ile	Ser	Val	Ile	Ser	Ser	Gly	Leu	Asp	Arg		
			275				280					285					
Glu	Lys	Val	Pro	Glu	Tyr	Thr	Leu	Thr	Ile	Gln	Ala	Thr	Asp	Met	Asp		
			290			295					300						
Gly	Asp	Gly	Ser	Thr	Thr	Thr	Ala	Val	Ala	Val	Val	Glu	Ile	Leu	Asp		
305					310				315					320			
Ala	Asn	Asp	Asn	Ala	Pro	Met	Phe	Asp	Pro	Gln	Lys	Tyr	Glu	Ala	His		
				325					330					335			
Val	Pro	Glu	Asn	Ala	Val	Gly	His	Glu	Val	Gln	Arg	Leu	Thr	Val	Thr		
			340					345					350				
Asp	Leu	Asp	Ala	Pro	Asn	Ser	Pro	Ala	Trp	Arg	Ala	Thr	Tyr	Leu	Ile		
			355				360					365					
Met	Gly	Gly	Asp	Asp	Gly	Asp	His	Phe	Thr	Ile	Thr	Thr	His	Pro	Glu		
			370			375					380						



Ser	Asn	Gln	Gly	Ile	Leu	Thr	Thr	Arg	Lys	Gly	Leu	Asp	Phe	Glu	Ala	
385					390					395					400	
Lys	Asn	Gln	His	Thr	Leu	Tyr	Val	Glu	Val	Thr	Asn	Glu	Ala	Pro	Phe	
			405					410						415		
Val	Leu	Lys	Leu	Pro	Thr	Ser	Thr	Ala	Thr	Ile	Val	Val	His	Val	Glu	
			420					425					430			
Asp	Val	Asn	Glu	Ala	Pro	Val	Phe	Val	Pro	Pro	Ser	Lys	Val	Val	Glu	
		435					440					445				
Val	Gln	Glu	Gly	Ile	Pro	Thr	Gly	Glu	Pro	Val	Cys	Val	Tyr	Thr	Ala	
	450					455					460					
Glu	Asp	Pro	Asp	Lys	Glu	Asn	Gln	Lys	Ile	Ser	Tyr	Arg	Ile	Leu	Arg	
465					470					475					480	
Asp	Pro	Ala	Gly	Trp	Leu	Ala	Met	Asp	Pro	Asp	Ser	Gly	Gln	Val	Thr	
				485					490					495		
Ala	Val	Gly	Thr	Leu	Asp	Arg	Glu	Asp	Glu	Gln	Phe	Val	Arg	Asn	Asn	
			500					505					510			
Ile	Tyr	Glu	Val	Met	Val	Leu	Ala	Met	Asp	Asn	Gly	Ser	Pro	Pro	Thr	
		515					520					525				
Thr	Gly	Thr	Gly	Thr	Leu	Leu	Leu	Thr	Leu	Ile	Asp	Val	Asn	Asp	His	
	530					535					540					
Gly	Pro	Val	Pro	Glu	Pro	Arg	Gln	Ile	Thr	Ile	Cys	Asn	Gln	Ser	Pro	
545					550					555					560	
Val	Arg	Gln	Val	Leu	Asn	Ile	Thr	Asp	Lys	Asp	Leu	Ser	Pro	His	Thr	
				565					570					575		
Ser	Pro	Phe	Gln	Ala	Gln	Leu	Thr	Asp	Asp	Ser	Asp	Ile	Tyr	Trp	Thr	
			580					585					590			
Ala	Glu	Val	Asn	Glu	Glu	Gly	Asp	Thr	Val	Val	Leu	Ser	Leu	Lys	Lys	
		595					600					605				
Phe	Leu	Lys	Gln	Asp	Thr	Tyr	Asp	Val	His	Leu	Ser	Leu	Ser	Asp	His	
	610					615					620					
Gly	Asn	Lys	Glu	Gln	Leu	Thr	Val	Ile	Arg	Ala	Thr	Val	Cys	Asp	Cys	
625					630					635					640	
His	Gly	His	Val	Glu	Thr	Cys	Pro	Gly	Pro	Trp	Lys	Gly	Gly	Phe	Ile	
				645					650					655		
Leu	Pro	Val	Leu	Gly	Ala	Val	Leu	Ala	Leu	Leu	Phe	Leu	Leu	Leu	Val	
			660					665					670			
Leu	Leu	Leu	Leu	Val	Arg	Lys	Lys	Arg	Lys	Ile	Lys	Glu	Pro	Leu	Leu	
		675					680					685				



Leu Pro Glu Asp Asp Thr Arg Asp Asn Val Phe Tyr Tyr Gly Glu Glu  
690 695 700

Gly Gly Gly Glu Glu Asp Gln Asp Tyr Asp Ile Thr Gln Leu His Arg  
705 710 715 720

Gly Leu Glu Ala Arg Pro Glu Val Val Leu Arg Asn Asp Val Ala Pro  
725 730 735

Thr Ile Ile Pro Thr Pro Met Tyr Arg Pro Arg Pro Ala Asn Pro Asp  
740 745 750

Glu Ile Gly Asn Phe Ile Ile Glu Asn Leu Lys Ala Ala Asn Thr Asp  
755 760 765

Pro Thr Ala Pro Pro Tyr Asp Thr Leu Leu Val Phe Asp Tyr Glu Gly  
770 775 780

Ser Gly Ser Asp Ala Ala Ser Leu Ser Ser Leu Thr Ser Ser Ala Ser  
785 790 795 800

Asp Gln Asp Gln Asp Tyr Asp Tyr Leu Asn Glu Trp Gly Ser Arg Phe  
805 810 815

Lys Lys Leu Ala Asp Met Tyr Gly Gly Gly Glu Asp Asp  
820 825

<210> 17  
<211> 694  
<212> PRT  
<213> Homo sapiens

<400> 17

Met Lys His Leu Lys Arg Trp Trp Ser Ala Gly Gly Gly Leu Leu His  
1 5 10 15

Leu Thr Leu Leu Leu Ser Leu Ala Gly Leu Arg Val Asp Leu Asp Leu  
20 25 30

Tyr Leu Leu Leu Pro Pro Pro Thr Leu Leu Gln Asp Glu Leu Leu Phe  
35 40 45

Leu Gly Gly Pro Ala Ser Ser Ala Tyr Ala Leu Ser Pro Phe Ser Ala  
50 55 60

Ser Gly Gly Trp Gly Arg Ala Gly His Leu His Pro Lys Gly Arg Glu  
65 70 75 80

Leu Asp Pro Ala Ala Pro Pro Glu Gly Gln Leu Leu Arg Glu Val Arg  
85 90 95

Ala Leu Gly Val Pro Phe Val Pro Arg Thr Ser Val Asp Ala Trp Leu  
100 105 110

Val His Ser Val Ala Ala Gly Ser Ala Asp Glu Ala His Gly Leu Leu



115	120	125
Gly Ala Ala Ala Ala Ser Ser Thr Gly Gly Ala Gly Ala Ser Val Asp 130 135 140		
Gly Gly Ser Gln Ala Val Gln Gly Gly Gly Gly Asp Pro Arg Ala Ala 145 150 155 160		
Arg Ser Gly Pro Leu Asp Ala Gly Glu Glu Glu Lys Ala Pro Ala Glu 165 170 175		
Pro Thr Ala Gln Val Pro Asp Ala Gly Gly Cys Ala Ser Glu Glu Asn 180 185 190		
Gly Val Leu Arg Glu Lys His Glu Ala Val Asp His Ser Ser Gln His 195 200 205		
Glu Glu Asn Glu Glu Arg Val Ser Ala Gln Lys Glu Asn Ser Leu Gln 210 215 220		
Gln Asn Asp Asp Asp Glu Asn Lys Ile Ala Glu Lys Pro Asp Trp Glu 225 230 235 240		
Ala Glu Lys Thr Thr Glu Ser Arg Asn Glu Arg His Leu Asn Gly Thr 245 250 255		
Asp Thr Ser Phe Ser Leu Glu Asp Leu Phe Gln Leu Leu Ser Ser Gln 260 265 270		
Pro Glu Asn Ser Leu Glu Gly Ile Ser Leu Gly Asp Ile Pro Leu Pro 275 280 285		
Gly Ser Ile Ser Asp Gly Met Asn Ser Ser Ala His Tyr His Val Asn 290 295 300		
Phe Ser Gln Ala Ile Ser Gln Asp Val Asn Leu His Glu Ala Ile Leu 305 310 315 320		
Leu Cys Pro Asn Asn Thr Phe Arg Arg Asp Pro Thr Ala Arg Thr Ser 325 330 335		
Gln Ser Gln Glu Pro Phe Leu Gln Leu Asn Ser His Thr Thr Asn Pro 340 345 350		
Glu Gln Thr Leu Pro Gly Thr Asn Leu Thr Gly Phe Leu Ser Pro Val 355 360 365		
Asp Asn His Met Arg Asn Leu Thr Ser Gln Asp Leu Leu Tyr Asp Leu 370 375 380		
Asp Ile Asn Ile Phe Asp Glu Ile Asn Leu Met Ser Leu Ala Thr Glu 385 390 395 400		
Asp Asn Phe Asp Pro Ile Asp Val Ser Gln Leu Phe Asp Glu Pro Asp 405 410 415		
Ser Asp Ser Gly Leu Ser Leu Asp Ser Ser His Asn Asn Thr Ser Val		



420	425	430
Ile Lys Ser Asn Ser Ser His Ser Val Cys Asp Glu Gly Ala Ile Gly 435 440 445		
Tyr Cys Thr Asp His Glu Ser Ser Ser His His Asp Leu Glu Gly Ala 450 455 460		
Val Gly Gly Tyr Tyr Pro Glu Pro Ser Lys Leu Cys His Leu Asp Gln 465 470 475 480		
Ser Asp Ser Asp Phe His Gly Asp Leu Thr Phe Gln His Val Phe His 485 490 495		
Asn His Thr Tyr His Leu Gln Pro Thr Ala Pro Glu Ser Thr Ser Glu 500 505 510		
Pro Phe Pro Trp Pro Gly Lys Ser Gln Lys Ile Arg Ser Arg Tyr Leu 515 520 525		
Glu Asp Thr Asp Arg Asn Leu Ser Arg Asp Glu Gln Arg Ala Lys Ala 530 535 540		
Leu His Ile Pro Phe Ser Val Asp Glu Ile Val Gly Met Pro Val Asp 545 550 555 560		
Ser Phe Asn Ser Met Leu Ser Arg Tyr Tyr Leu Thr Asp Leu Gln Val 565 570 575		
Ser Leu Ile Arg Asp Ile Arg Arg Arg Gly Lys Asn Lys Val Ala Ala 580 585 590		
Gln Asn Cys Arg Lys Arg Lys Leu Asp Ile Ile Leu Asn Leu Glu Asp 595 600 605		
Asp Val Cys Asn Leu Gln Ala Lys Lys Glu Thr Leu Lys Arg Glu Gln 610 615 620		
Ala Gln Cys Asn Lys Ala Ile Asn Ile Met Lys Gln Lys Leu His Asp 625 630 635 640		
Leu Tyr His Asp Ile Phe Ser Arg Leu Arg Asp Asp Gln Gly Arg Pro 645 650 655		
Val Asn Pro Asn His Tyr Ala Leu Gln Cys Thr His Asp Gly Ser Ile 660 665 670		
Leu Ile Val Pro Lys Glu Leu Val Ala Ser Gly His Lys Lys Glu Thr 675 680 685		
Gln Lys Gly Lys Arg Lys 690		

<210> 18  
 <211> 402  
 <212> PRT  
 <213> Homo sapiens



<400> 18

Met	Lys	Leu	Glu	Val	Phe	Val	Pro	Arg	Ala	Ala	His	Gly	Asp	Lys	Gln	
1				5					10					15		
Gly	Ser	Asp	Leu	Glu	Gly	Ala	Gly	Gly	Ser	Asp	Ala	Pro	Ser	Pro	Leu	
			20					25					30			
Ser	Ala	Ala	Gly	Asp	Asp	Ser	Leu	Gly	Ser	Asp	Gly	Asp	Cys	Ala	Ala	
	35						40					45				
Lys	Pro	Ser	Ala	Gly	Gly	Gly	Ala	Arg	Asp	Thr	Gln	Gly	Asp	Gly	Glu	
	50					55					60					
Gln	Ser	Ala	Gly	Gly	Gly	Pro	Gly	Ala	Glu	Glu	Ala	Ile	Pro	Ala	Ala	
65					70					75					80	
Ala	Ala	Ala	Ala	Val	Val	Ala	Glu	Gly	Ala	Glu	Ala	Gly	Ala	Ala	Gly	
				85					90					95		
Pro	Gly	Ala	Gly	Gly	Ala	Gly	Ser	Gly	Glu	Gly	Ala	Arg	Ser	Lys	Pro	
			100					105						110		
Tyr	Thr	Arg	Arg	Pro	Lys	Pro	Pro	Tyr	Ser	Tyr	Ile	Ala	Leu	Ile	Ala	
		115					120					125				
Met	Ala	Ile	Arg	Asp	Ser	Ala	Gly	Gly	Arg	Leu	Thr	Leu	Ala	Glu	Ile	
	130					135					140					
Asn	Glu	Tyr	Leu	Met	Gly	Lys	Phe	Pro	Phe	Phe	Arg	Gly	Ser	Tyr	Thr	
145					150					155					160	
Gly	Trp	Arg	Asn	Ser	Val	Arg	His	Asn	Leu	Ser	Leu	Asn	Asp	Cys	Phe	
				165					170					175		
Val	Lys	Val	Leu	Arg	Asp	Pro	Ser	Arg	Pro	Trp	Gly	Lys	Asp	Asn	Tyr	
			180					185					190			
Trp	Met	Leu	Asn	Pro	Asn	Ser	Glu	Tyr	Thr	Phe	Ala	Asp	Gly	Val	Phe	
	195						200					205				
Arg	Arg	Arg	Arg	Lys	Arg	Leu	Ser	His	Arg	Ala	Pro	Val	Pro	Ala	Pro	
	210					215					220					
Gly	Leu	Arg	Pro	Glu	Glu	Ala	Pro	Gly	Leu	Pro	Ala	Ala	Pro	Pro	Pro	
225					230					235					240	
Ala	Pro	Ala	Ala	Pro	Ala	Ser	Pro	Arg	Met	Arg	Ser	Pro	Ala	Arg	Gln	
				245					250					255		
Glu	Glu	Arg	Ala	Ser	Pro	Ala	Gly	Lys	Phe	Ser	Ser	Ser	Phe	Ala	Ile	
			260					265					270			
Asp	Ser	Ile	Leu	Arg	Lys	Pro	Phe	Arg	Ser	Arg	Arg	Leu	Arg	Asp	Thr	
		275					280					285				



Ala Pro Gly Thr Thr Leu Gln Trp Gly Ala Ala Pro Cys Pro Pro Leu  
290 295 300

Pro Ala Phe Pro Ala Leu Leu Pro Ala Ala Pro Cys Arg Ala Leu Leu  
305 310 315 320

Pro Leu Cys Ala Tyr Gly Ala Gly Glu Pro Ala Arg Leu Gly Ala Arg  
325 330 335

Glu Ala Glu Val Pro Pro Thr Ala Pro Pro Leu Leu Leu Ala Pro Leu  
340 345 350

Pro Ala Ala Ala Pro Ala Lys Pro Leu Arg Gly Pro Ala Ala Gly Gly  
355 360 365

Ala His Leu Tyr Cys Pro Leu Arg Leu Pro Ala Ala Leu Gln Ala Ala  
370 375 380

Leu Val Arg Arg Pro Gly Pro His Leu Ser Tyr Pro Val Glu Thr Leu  
385 390 395 400

Leu Ala

<210> 19  
<211> 209  
<212> PRT  
<213> Homo sapiens

<400> 19

Met Glu Lys His His Val Pro Ser Asp Phe Asn Val Asn Val Lys Val  
1 5 10 15

Asp Thr Gly Pro Arg Glu Asp Leu Ile Lys Val Leu Glu Asp Met Arg  
20 25 30

Gln Glu Tyr Glu Leu Ile Ile Lys Lys Lys His Arg Asp Leu Asp Thr  
35 40 45

Trp Tyr Lys Glu Gln Ser Ala Ala Met Ser Gln Glu Ala Ala Ser Pro  
50 55 60

Ala Thr Val Gln Ser Arg Gln Gly Asp Ile His Glu Leu Lys Arg Thr  
65 70 75 80

Phe Gln Ala Leu Glu Ile Asp Leu Gln Ala Gln Tyr Ser Thr Lys Ser  
85 90 95

Ala Leu Glu Asn Met Leu Ser Glu Thr Gln Ser Arg Tyr Ser Cys Lys  
100 105 110

Leu Gln Asp Met Gln Glu Ile Ile Ser His Tyr Glu Glu Glu Leu Thr  
115 120 125

Gln Leu Arg His Glu Leu Glu Arg Gln Asn Asn Glu Tyr Gln Val Leu  
130 135 140



Leu Gly Ile Lys Thr His Leu Glu Lys Glu Ile Thr Thr Tyr Arg Arg  
145 150 155 160

Leu Leu Glu Gly Glu Ser Glu Gly Thr Arg Glu Glu Ser Lys Ser Ser  
165 170 175

Met Lys Val Ser Ala Thr Pro Lys Ile Lys Ala Ile Thr Gln Glu Thr  
180 185 190

Ile Asn Gly Arg Leu Val Leu Cys Gln Val Asn Glu Ile Gln Lys His  
195 200 205

Ala

<210> 20

<211> 278

<212> PRT

<213> Homo sapiens

<400> 20

Met Asp Lys Ser Gly Ile Asp Ser Leu Asp His Val Thr Ser Asp Ala  
1 5 10 15

Val Glu Leu Ala Asn Arg Ser Asp Asn Ser Ser Asp Ser Ser Leu Phe  
20 25 30

Lys Thr Gln Cys Ile Pro Tyr Ser Pro Lys Gly Glu Lys Arg Asn Pro  
35 40 45

Ile Arg Lys Phe Val Arg Thr Pro Glu Ser Val His Ala Ser Asp Ser  
50 55 60

Ser Ser Asp Ser Ser Phe Glu Pro Ile Pro Leu Thr Ile Lys Ala Ile  
65 70 75 80

Phe Glu Arg Phe Lys Asn Arg Lys Lys Arg Tyr Lys Lys Lys Lys Lys  
85 90 95

Arg Arg Tyr Gln Pro Thr Gly Arg Pro Arg Gly Arg Pro Glu Gly Arg  
100 105 110

Arg Asn Pro Ile Tyr Ser Leu Ile Asp Lys Lys Lys Gln Phe Arg Ser  
115 120 125

Arg Gly Ser Gly Phe Pro Phe Leu Glu Ser Glu Asn Glu Lys Asn Ala  
130 135 140

Pro Trp Arg Lys Ile Leu Thr Phe Glu Gln Ala Val Ala Arg Gly Phe  
145 150 155 160

Phe Asn Tyr Ile Glu Lys Leu Lys Tyr Glu His His Leu Lys Glu Ser  
165 170 175

Leu Lys Gln Met Asn Val Gly Glu Asp Leu Glu Asn Glu Asp Phe Asp  
180 185 190



Ser Arg Arg Tyr Lys Phe Leu Asp Asp Asp Gly Ser Ile Ser Pro Ile  
195 200 205

Glu Glu Ser Thr Ala Glu Asp Glu Asp Ala Thr His Leu Glu Asp Asn  
210 215 220

Glu Cys Asp Ile Lys Leu Ala Gly Asp Ser Phe Ile Val Ser Ser Glu  
225 230 235 240

Phe Pro Val Arg Leu Ser Val Tyr Leu Glu Glu Glu Asp Ile Thr Glu  
245 250 255

Glu Ala Ala Leu Ser Lys Lys Arg Ala Thr Lys Ala Lys Asn Thr Gly  
260 265 270

Gln Arg Gly Leu Lys Met  
275

<210> 21  
<211> 488  
<212> PRT  
<213> C-TERMINAL PORTION OF ColoUp2

<400> 21

Ala Val Leu Ala Ala His Cys Pro Phe Tyr Ser Trp Lys Arg Val Phe  
1 5 10 15

Leu Thr His Pro Ala Thr Cys Tyr Arg Thr Thr Cys Pro Gly Pro Cys  
20 25 30

Asp Ser Gln Pro Cys Gln Asn Gly Gly Thr Cys Val Pro Glu Gly Leu  
35 40 45

Asp Gly Tyr Gln Cys Leu Cys Pro Leu Ala Phe Gly Gly Glu Ala Asn  
50 55 60

Cys Ala Leu Lys Leu Ser Leu Glu Cys Arg Val Asp Leu Leu Phe Leu  
65 70 75 80

Leu Asp Ser Ser Ala Gly Thr Thr Leu Asp Gly Phe Leu Arg Ala Asp  
85 90 95

Val Phe Val Lys Arg Phe Val Arg Ala Val Leu Ser Glu Asp Ser Arg  
100 105 110

Ala Arg Val Gly Val Ala Thr Tyr Ser Arg Glu Leu Leu Val Ala Val  
115 120 125



Pro Val Gly Glu Tyr Gln Asp Val Pro Asp Leu Val Trp Ser Leu Asp  
130 135 140

Gly Ile Pro Phe Arg Gly Gly Pro Thr Leu Thr Gly Ser Ala Leu Arg  
145 150 155 160

Gln Ala Ala Glu Arg Gly Phe Gly Ser Ala Thr Arg Thr Gly Gln Asp  
165 170 175

Arg Pro Arg Arg Val Val Val Leu Leu Thr Glu Ser His Ser Glu Asp  
180 185 190

Glu Val Ala Gly Pro Ala Arg His Ala Arg Ala Arg Glu Leu Leu Leu  
195 200 205

Leu Gly Val Gly Ser Glu Ala Val Arg Ala Glu Leu Glu Glu Ile Thr  
210 215 220

Gly Ser Pro Lys His Val Met Val Tyr Ser Asp Pro Gln Asp Leu Phe  
225 230 235 240

Asn Gln Ile Pro Glu Leu Gln Gly Lys Leu Cys Ser Arg Gln Arg Pro  
245 250 255

Gly Cys Arg Thr Gln Ala Leu Asp Leu Val Phe Met Leu Asp Thr Ser  
260 265 270

Ala Ser Val Gly Pro Glu Asn Phe Ala Gln Met Gln Ser Phe Val Arg  
275 280 285

Ser Cys Ala Leu Gln Phe Glu Val Asn Pro Asp Val Thr Gln Val Gly  
290 295 300

Leu Val Val Tyr Gly Ser Gln Val Gln Thr Ala Phe Gly Leu Asp Thr  
305 310 315 320

Lys Pro Thr Arg Ala Ala Met Leu Arg Ala Ile Ser Gln Ala Pro Tyr  
325 330 335

Leu Gly Gly Val Gly Ser Ala Gly Thr Ala Leu Leu His Ile Tyr Asp  
340 345 350

Lys Val Met Thr Val Gln Arg Gly Ala Arg Pro Gly Val Pro Lys Ala



355                      360                      365  
 Val Val Val Leu Thr Gly Gly Arg Gly Ala Glu Asp Ala Ala Val Pro  
      370                      375                      380  
 Ala Gln Lys Leu Arg Asn Asn Gly Ile Ser Val Leu Val Val Gly Val  
      385                      390                      395                      400  
 Gly Pro Val Leu Ser Glu Gly Leu Arg Arg Leu Ala Gly Pro Arg Asp  
                          405                      410                      415  
 Ser Leu Ile His Val Ala Ala Tyr Ala Asp Leu Arg Tyr His Gln Asp  
                          420                      425                      430  
 Val Leu Ile Glu Trp Leu Cys Gly Glu Ala Lys Gln Pro Val Asn Leu  
                          435                      440                      445  
 Cys Lys Pro Ser Pro Cys Met Asn Glu Gly Ser Cys Val Leu Gln Asn  
      450                      455                      460  
 Gly Ser Tyr Arg Cys Lys Cys Arg Asp Gly Trp Glu Gly Pro His Cys  
      465                      470                      475                      480  
 Glu Asn Arg Phe Leu Arg Arg Pro  
                          485

<210> 22  
 <211> 403  
 <212> PRT  
 <213> HUMAN FOXQ1

<400> 22

Met Lys Leu Glu Val Phe Val Pro Arg Ala Ala His Gly Asp Lys Gln  
 1                      5                      10                      15  
 Gly Ser Asp Leu Glu Gly Ala Gly Gly Ser Asp Ala Pro Ser Pro Leu  
                          20                      25                      30  
 Ser Ala Ala Gly Asp Asp Ser Leu Gly Ser Asp Gly Asp Cys Ala Ala  
                          35                      40                      45  
 Asn Ser Pro Ala Ala Gly Gly Gly Ala Arg Asp Pro Pro Gly Asp Gly  
      50                      55                      60



Glu Gln Ser Ala Gly Gly Gly Pro Gly Ala Glu Glu Ala Ile Pro Ala  
65 70 75 80

Ala Ala Ala Ala Ala Val Val Ala Glu Gly Ala Glu Ala Gly Ala Ala  
85 90 95

Gly Pro Gly Ala Gly Gly Ala Gly Ser Gly Glu Gly Ala Arg Ser Lys  
100 105 110

Pro Tyr Thr Arg Arg Pro Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile  
115 120 125

Ala Met Ala Ile Arg Asp Ser Ala Gly Gly Arg Leu Thr Leu Ala Glu  
130 135 140

Ile Asn Glu Tyr Leu Met Gly Lys Phe Pro Phe Phe Arg Gly Ser Tyr  
145 150 155 160

Thr Gly Trp Arg Asn Ser Val Arg His Asn Leu Ser Leu Asn Asp Cys  
165 170 175

Phe Val Lys Val Leu Arg Asp Pro Ser Arg Pro Trp Gly Lys Asp Asn  
180 185 190

Tyr Trp Met Leu Asn Pro Asn Ser Glu Tyr Thr Phe Ala Asp Gly Val  
195 200 205

Phe Arg Arg Arg Arg Lys Arg Leu Ser His Arg Ala Pro Val Pro Ala  
210 215 220

Pro Gly Leu Arg Pro Glu Glu Ala Pro Gly Leu Pro Ala Ala Pro Pro  
225 230 235 240

Pro Ala Pro Ala Ala Pro Ala Ser Pro Arg Met Arg Ser Pro Ala Arg  
245 250 255

Gln Glu Glu Arg Ala Ser Pro Ala Gly Lys Phe Ser Ser Ser Phe Ala  
260 265 270

Ile Asp Ser Ile Leu Arg Lys Pro Phe Arg Ser Arg Arg Leu Arg Asp  
275 280 285



Thr Ala Pro Gly Thr Thr Leu Gln Trp Gly Ala Ala Pro Cys Pro Pro  
290 295 300

Leu Pro Ala Phe Pro Ala Leu Leu Pro Ala Ala Pro Cys Arg Ala Leu  
305 310 315 320

Leu Pro Leu Cys Ala Tyr Gly Ala Gly Glu Pro Ala Arg Leu Gly Ala  
325 330 335

Arg Glu Ala Glu Val Pro Pro Thr Ala Pro Pro Leu Leu Leu Ala Pro  
340 345 350

Leu Pro Ala Ala Ala Pro Ala Lys Pro Leu Arg Gly Pro Ala Ala Gly  
355 360 365

Gly Ala His Leu Tyr Cys Pro Leu Arg Leu Pro Ala Ala Leu Gln Ala  
370 375 380

Ala Ser Val Arg Arg Pro Gly Pro His Leu Pro Tyr Pro Val Glu Thr  
385 390 395 400

Leu Leu Ala

<210> 23  
<211> 400  
<212> PRT  
<213> MOUSE FOXQ1

<400> 23

Met Lys Leu Glu Val Phe Val Pro Arg Ala Ala His Gly Asp Lys Met  
1 5 10 15

Gly Ser Asp Leu Glu Gly Ala Gly Ser Ser Asp Val Pro Ser Pro Leu  
20 25 30

Ser Ala Ala Gly Asp Asp Ser Leu Gly Ser Asp Gly Asp Cys Ala Ala  
35 40 45

Asn Ser Pro Ala Ala Gly Ser Gly Ala Gly Asp Leu Glu Gly Gly Gly  
50 55 60

Gly Glu Arg Asn Ser Ser Gly Gly Pro Ser Ala Gln Asp Gly Pro Glu  
65 70 75 80



Ala Thr Asp Asp Ser Arg Thr Gln Ala Ser Ala Ala Gly Pro Cys Ala  
85 90 95

Gly Gly Val Gly Gly Gly Glu Gly Ala Arg Ser Lys Pro Tyr Thr Arg  
100 105 110

Arg Pro Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala Met Ala Ile  
115 120 125

Arg Asp Ser Ala Gly Gly Arg Leu Thr Leu Ala Glu Ile Asn Glu Tyr  
130 135 140

Leu Met Gly Lys Phe Pro Phe Phe Arg Gly Ser Tyr Thr Gly Trp Arg  
145 150 155 160

Asn Ser Val Arg His Asn Leu Ser Leu Asn Asp Cys Phe Val Lys Val  
165 170 175

Leu Arg Asp Pro Ser Arg Pro Trp Gly Lys Asp Asn Tyr Trp Met Leu  
180 185 190

Asn Pro Asn Ser Glu Tyr Thr Phe Ala Asp Gly Val Phe Arg Arg Arg  
195 200 205

Arg Lys Arg Leu Ser His Arg Thr Thr Val Ser Ala Ser Gly Leu Arg  
210 215 220

Pro Glu Glu Ala Pro Pro Gly Pro Ala Gly Thr Pro Gln Pro Ala Pro  
225 230 235 240

Ala Ala Arg Ser Ser Pro Ile Ala Arg Ser Pro Ala Arg Gln Glu Glu  
245 250 255

Arg Ser Ser Pro Ala Ser Lys Phe Ser Ser Ser Phe Ala Ile Asp Ser  
260 265 270

Ile Leu Ser Lys Pro Phe Arg Ser Arg Arg Asp Gly Asp Ser Ala Leu  
275 280 285

Gly Val Gln Leu Pro Trp Gly Ala Ala Pro Cys Pro Pro Leu Arg Ala  
290 295 300



Tyr Pro Ala Leu Leu Pro Ala Ala Pro Gly Gly Ala Leu Leu Pro Leu  
305 310 315 320

Cys Ala Tyr Gly Ala Ser Glu Pro Thr Leu Leu Ala Ser Arg Gly Thr  
325 330 335

Glu Val Gln Pro Ala Ala Pro Leu Leu Leu Ala Pro Leu Ser Thr Ala  
340 345 350

Ala Pro Ala Lys Pro Phe Arg Gly Pro Glu Thr Ala Gly Ala Ala His  
355 360 365

Leu Tyr Cys Pro Leu Arg Leu Pro Thr Ala Leu Gln Ala Ala Ala Ala  
370 375 380

Cys Gly Pro Gly Pro His Leu Ser Tyr Pro Val Glu Thr Leu Leu Ala  
385 390 395 400

<210> 24  
<211> 400  
<212> PRT  
<213> RAT FOX Q1

<400> 24

Met Lys Leu Glu Val Phe Ala Pro Arg Ala Ala His Gly Asp Lys Met  
1 5 10 15

Gly Ser Asp Leu Glu Gly Ala Gly Ser Ser Asp Val Pro Ser Pro Leu  
20 25 30

Ser Ala Ala Gly Asp Asp Ser Leu Gly Ser Asp Gly Asp Cys Ala Ala  
35 40 45

Asn Ser Pro Ala Ala Gly Arg Gly Ala Val Asp Leu Glu Gly Gly Gly  
50 55 60

Gly Glu Arg Asn Ser Ser Gly Gly Ala Ser Thr Gln Asp Asp Pro Glu  
65 70 75 80

Val Thr Asp Gly Ser Arg Thr Gln Ala Ser Pro Val Gly Pro Cys Ala  
85 90 95

Gly Ser Val Gly Gly Gly Glu Gly Ala Arg Ser Lys Pro Tyr Thr Arg  
100 105 110



Arg Pro Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala Met Ala Ile  
115 120 125

Arg Asp Ser Ala Gly Gly Arg Leu Thr Leu Ala Glu Ile Asn Glu Tyr  
130 135 140

Leu Met Gly Lys Phe Pro Phe Phe Arg Gly Ser Tyr Thr Gly Trp Arg  
145 150 155 160

Asn Ser Val Arg His Asn Leu Ser Leu Asn Asp Cys Phe Val Lys Val  
165 170 175

Leu Arg Asp Pro Ser Arg Pro Trp Gly Lys Asp Asn Tyr Trp Met Leu  
180 185 190

Asn Pro Asn Ser Glu Tyr Thr Phe Ala Asp Gly Val Phe Arg Arg Arg  
195 200 205

Arg Lys Arg Leu Ser His Arg Thr Thr Val Ser Ala Ser Gly Leu Arg  
210 215 220

Pro Glu Glu Ala Pro Pro Gly Pro Ala Gly Thr Pro Gln Pro Ala Pro  
225 230 235 240

Thr Ala Gly Ser Ser Pro Ile Ala Arg Ser Pro Ala Arg Gln Glu Glu  
245 250 255

Gly Ser Ser Pro Ala Ser Lys Phe Ser Ser Ser Phe Ala Ile Asp Ser  
260 265 270

Ile Leu Ser Lys Pro Phe Arg Ser Arg Arg Asp Gly Asp Pro Ala Leu  
275 280 285

Gly Val Gln Leu Pro Trp Ser Ala Ala Pro Cys Pro Pro Leu Arg Ala  
290 295 300

Tyr Pro Ala Leu Leu Pro Ala Ser Ser Gly Gly Ala Leu Leu Pro Leu  
305 310 315 320

Cys Ala Tyr Gly Ala Gly Glu Pro Thr Leu Leu Ala Ser Arg Gly Ala  
325 330 335



Glu Val Gln Pro Ala Ala Pro Leu Leu Leu Ala Pro Leu Ser Thr Ala  
340 345 350

Ala Pro Ala Lys Pro Phe Arg Gly Pro Glu Thr Ala Gly Ala Ala His  
355 360 365

Leu Tyr Cys Pro Leu Arg Leu Pro Thr Ala Leu Gln Ala Ala Ala Ala  
370 375 380

Cys Gly Pro Gly Pro His Leu Ser Tyr Arg Val Glu Thr Leu Leu Ala  
385 390 395 400

<210> 25  
<211> 1212  
<212> DNA  
<213> HUMAN FOXQ1

<400> 25  
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gagggcgcg ggcgcagcga cgcgcgcgtcc ccgctgtcgg cggcgggaga cgactccctg 120  
ggctcagatg gggactgcgc ggccaacagc ccggccgcgg gcggcggcgc cagagatccg 180  
ccgggcgacg gcgaacagag tgcgggaggg gggccggggc cggaggaggc gatcccgcca 240  
gcagctgctg cagcgggtggg ggccgagggc gcggaggccg gggcggcggg gccaggcgcg 300  
ggcggcgcg ggagcggcga gggcgcacgc agcaagccat atacgcggcg gcccaagccc 360  
ccctactcgt acatcgcgct catcgccatg gccatccgcg actcggcggg cgggcgcttg 420  
acgctggcgg agatcaacga gtacctcatg ggcaagttcc cctttttccg cggcagctac 480  
acgggctggc gcaactcgt gcgccacaac ctttcgctca acgactgctt cgtcaagggtg 540  
ctgcgcgacc cctcgcgggc ctggggcaag gacaactact ggatgctcaa cccaacagc 600  
gagtacacct tcgccgacgg ggtcttccgc cgcgcgcgca agcgctcag ccaccgcgcg 660  
ccggtccccg cgcgggggt gcggcccag gagggcccgg gcctccccgc cgcggcgccg 720  
cccgcggcgg cgcggcggc ctcggccgc atgcgctcgc ccggccgcca ggaggagcgc 780  
gccagccccg cgggcaagtt ctccagctcc ttgcctatcg acagcctcct gcgcaagccc 840  
ttccgcagcc gccgcctcag ggacacggcc cccgggacga cgcttcagtg gggcgccgcg 900  
ccctgcccgc cgctgcccgc gttccccgc ctcctccccg cggcgccctg cagggccctg 960  
ctgccgctct gcgcgtacgg cgcgggagag ccggcgcggc tgggcgcgcg cgaggccgag 1020  
gtgccaccga ccgcgcgcgc cctcctgctt gcacctctcc cggcgggcgg ccccgccaag 1080



ccactccgag gcccgggcggc cggcgggcgcg cacctgtact gccccctgcg gctgccccgca	1140
gccctgcagg cggcctcagt ccgcgcacct ggcccgccacc tgccgtaccc ggtggagacg	1200
ctcctagcct ga	1212

<210> 26  
 <211> 1203  
 <212> DNA  
 <213> MOUSE FOXQ1

<400> 26	
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gagggggccg gcagcagcga cgtgccatct ccactgtccg cggctggtga cgactcctta	120
ggctcagacg gggactgtgc agccaacagc cggcgggcgg gcagcggcgc cggggatctg	180
gaaggtggcg gcggcgagag gaattcgagt ggcgggccga gcgccaaga cggtcgggag	240
gcaactgatg acagcagaac gcaggcctcc gcggcagggc cgtgcgcggg cggcgtgggc	300
ggcgggcagg gcgcgcgcag caagccgtac acgcggcggc ccaagcccc atactcctac	360
atcgctctca tcgccatggc catccgcgac tccgcggggc gacgcctgac actggccgag	420
atcaacgagt acctcatggg caagttcccc tttttccggg gcagctacac gggctggcgc	480
aactccgtgc gccacaacct ctcgctcaac gactgtttcg tcaaggtgct gcgcgacccc	540
tcgcggccct ggggcaagga caactactgg atgctcaacc ccaacagcga atacaccttc	600
gccgacgggg tcttccgccg ccgcgcgaag cgcctcagcc accggaccac agtctccgcg	660
tccgggctgc ggccggagga agccccaccc ggacctgccg ggaccccgca gcccgcgccc	720
gccgcccgtc cctccccgat cgcgcgctcg ccggctcgcc aggaggagcg ctccagccct	780
gcgagcaagt tctccagctc cttcgccatc gacagcatte tcagcaagcc ttttcgcagc	840
cgcgcgcgac gcgactcggc tctgggggtg cagctaccct ggggcgcgcg tccttgcccg	900
ccgctgcgcg cctatcccgc gtccttccc gcggcgcccc gtggcgctct gctaccgctc	960
tgtgcttacg gcgcaagcga gcctacgctg ctggcgctgc gcgggaccga ggtgcagccc	1020
gcggcgcccc ttctgctggc gcccctctcc accgcggctc cagccaagcc attccgaggt	1080
ccggagaccg ccggcgcggc gcacctgtac tgccccctac ggctgcccac ggccctgcag	1140
gcggcagcgg cctgcggtcc cggtcgcac ctgtcctacc cggtgagagac tctgctagct	1200
tga	1203

<210> 27



<211> 1203  
<212> DNA  
<213> RAT FOXQ1

<400> 27  
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gagggggccg gcagcagcga cgtgccatct ccgctgtccg cggctggcga cgactcctta 120  
ggctctgacg gggactgtgc agccaacagc ccggcggcgg gcagaggcgc cgtggatctg 180  
gaaggcggcg gcggcgagag gaattcgagt ggcggggcga gcaccaaga cgatcccgag 240  
gtgaccgatg gcagcagaac gcaggcctcc ccggtggggc cgtgcgcggg cagcgtgggc 300  
ggcggtgagg gcgcgcgcag caagccgtac acgcggcggc ccaagccccc ctactcctac 360  
atcgactca tcgccatggc catccgcgac tccgcgggcg gacgcctgac gctggccgag 420  
atcaacgagt acctcatggg caagttcccc tttttccggg gcagctacac gggctggcgc 480  
aactccgtgc gccacaacct ctgcgtcaac gactgtttcg tcaaggtgct gcgcgacccc 540  
tcgcggccct ggggcaagga caattactgg atgtcaacc ccaacagcga atacaccttc 600  
gccgacgggg tcttccgccg ccgccgcaag cgcctcagcc accggaccac agtctccgca 660  
tcggggctac ggccggagga agccccaccc ggacctgcgg ggaccccgca gcccgcgccc 720  
accgccggct cctccccaat cgcgcgctcg cccgctcgcc aggaggaggg ctccagcccg 780  
gcgagcaagt tctccagctc cttcgccatc gacagcatcc tcagcaagcc gtttcgcagc 840  
cgccgcgacg gcgacccggc tctgggggtg cagctaccct ggagcgtgc tccctgcccg 900  
ccgctgcgcg cctatcccgc gtccttccc gcgtcgccg gcggtgccct gctgccgctc 960  
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gcggcgcccc tggtgctggc gccctctcc acccgggccc cagccaagcc atttcgaggt 1080  
ccggagaccg ccggcgcggc gcacctgtac tgccccctac ggctgcccac ggccctgcag 1140  
gcggccgcgg cctgcggtcc gggtcgcgac ctgtcctacc gggtgagagac gctgctagct 1200  
tga 1203